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#14 Reply Brief J. EVANS 12-20-02

IN THE UNITED STATES PATENT & TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

IN RE APPLICATION OF
Dick Lee Knox

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EXAMINER:
Dang D. Le

FILED: 09/07/2000

GROUP ART UNIT: 2855

TITLE: **Motor Bearing for Submersible Motors**

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BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANT'S REPLY BRIEF
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

The Examiner's Answer notes that Summary of the Invention in Applicant's brief does not refer to pages, lines and figures. Applicant apologizes for this omission, and should the Board desire, will send an Amended Brief with pages, lines and numbers in the Summary.

In regard to the grouping of the claims, the Examiner contends that claims 1-7 stand or fall together and claims 8-14 stand or fall together. Applicant respectfully disagrees. Applicant submits that one group should be claims 1-3, 5-9 and 11-13, while the other group should be claims 4, 10 and 14. The reason is that dependent claims 4, 10 and 14 all claim the second embodiment, which is shown in Figure 4. In that embodiment, a plurality of coil spring segments 45' are spaced circumferentially around bearing body 35, rather than a single coiled spring as in the first embodiment. The reference to Ide was applied only in regard to these claims, not to the others. Applicant submits that these claims are independently patentable over

the claims of group 1. That is, applicant submits that it would not be obvious to one skilled in the art to use segments of a coil spring around a bearing as an anti-rotation element. Therefore, Applicant submits that claims 1-3, 5-9, 11-13 should be grouped in one group, while claims 4, 10 and 14 should be grouped in the second group.

In making the combination of Beavers and Balsells, the Examiner stated in the Answer that they are in the same field of endeavor. Applicant respectfully disagrees. This invention deals with bearings for submersible pump motors. Referring to Figure 1, as shaft 19 rotates, bearings provide lateral stabilization. Bearing sleeve 27 rotates with shaft 19, while body 35 is stationary. Coil spring 45 frictionally engages the inner diameter of stator 15 to prevent rotation of body 35.

Balsells, on the other hand, deals with a reciprocating shaft, such as a reciprocating pump (column 1, line 9). The problem that Balsells encounters is avoiding excessive loading on the bearing caused by misalignment of the shaft. Balsells therefore utilizes a spring 22 to provide radial compliance. Spring 22 allows some radial vibration or movement of the bearing body 12 to occur. Spring 22 is located between two reciprocating components, thus does not prevent rotation of one of them.

Beavers does deal with the same field of endeavor as Applicant, which is submersible pump motors. Assuming that Beavers' wavy spring 41 did not provide enough force to prevent rotation of bearing body 33 or had some other disadvantage, Applicant submits that one skilled in the art might look to other bearing arrangements for an anti-rotation mechanism. However, one skilled in the art would not look at the art of reciprocating shaft pumps as in Balsells because the shaft moves axially, not rotatably. One viewing Balsells would realize that a spring 22 may

be utilized to provide some radial compliance of bearing body 12 to allow bearing body 12 to move radially slightly. However, one would not expect spring 22 to have enough hoop strength to prevent rotation of bearing body 12. Because Balsells does not utilize spring 22 as an anti-rotation element, it is an entirely different field of endeavor.

Additionally, the Examiner contends that Nogle is in the same field of endeavor as Beavers and Balsells. Nogle does deal with a rotating shaft bearing, however it is used for a compressor shaft for an automobile gas turbine engine. Furthermore, Nogle discloses coil springs 34 for allowing some radial compliance or vibration to occur without imparting that vibration to housing 11. Coil springs 34 do not serve as anti-rotation elements. Sleeve 14 is prevented from rotation by means of a radially offset tab 19. Consequently, one skilled in the art of submersible pump motors would not learn from Nogle that a coil spring could solve a problem in preventing rotation of a bearing body, because the coil springs of Nogle are used for radial compliance.

While Beavers shows a wavy spring 41 to frictionally engage the stator and the bearing to prevent rotation of bearing 25, it is not a mere change of form to use a coil spring in lieu of a wavy spring. A wavy spring is a resilient band shaped with undulations to exert a radial force against the bearing body and the stator wall. A coil spring, on the other hand, must reply on the hoop strength of its separate coils to provide the force to prevent rotation. The Examiner has not cited a single instance where a coil spring is used as an anti-rotation member. One reading these patents would not realize that a coil spring can have sufficient hoop strength so that when installed around the circumference of a bearing body, it will prevent rotation of the bearing body. Because a wavy spring does not have a hoop strength, Applicant submits that it is not a mere change in form to compare a wavy spring to a coil spring.

On page 11 of the Answer, the Examiner stated that the spring can be used to support the shaft through the bearing sleeve for purposes different from preventing the rotation of the bearing. Presumably, the Examiner means that Applicant's claims would read on the Balsells or Nogle even though the coil springs are not anti-rotation members in these reference. However, Applicant submits that the claims require that the coil spring be located between a bearing body and a stator to prevent rotation of the bearing body. Neither Balsells or Nogle show a coil spring between a bearing body and a stator, thus the claims do not read on Balsells or Nogle.

The Examiner also pointed out that the claims are apparatus claims, not method claims, therefore they must be structurally distinguished from the prior art. Applicant submits that the claims are structurally distinguishable. Applicant's claims claim in combination a rotating shaft and a bearing. This distinguishes over Balsells, which does not show a rotating shaft. Applicant claims a coil spring located between a bearing body and frictionally engaging the inner diameter of a stator wall. Nogle does not show the inner diameter of a stator wall, therefore the claim structurally distinguishes over Nogle. The claims do recite structure and not mere function, and that is why they were not rejected under 35 USC 102 over Nogle or Balsells. Whether the claims are written as method or apparatus, the question is still whether it would be obvious to use a coil spring in place of the wavy spring of Beavers.

In regard to the rejection of the Group 2 claims, none of the references show coil spring segments circumferentially spaced around a bearing body. Nogle and Balsells show continuous coil springs. Instead of springs, Ide shows resilient wheels 137 that prevent rotation of the bearing body and which can roll up and down the inner diameter of the stator. Wheels 37 accommodate longitudinal movement of the bearing body relative to the stator due to thermal growth. Substituting coil spring segments for rolling wheels is certainly not obvious. The coil

spring segments do not roll, which is the desired result of the use of wheels 37. Ide states at column 1, lines 47-49 that the bearing body must be free to move axially to accommodate thermal expansion of the shaft. Yet there is no suggestion that a coil spring, with its frictional engagement with the stator, would slide to accommodate thermal growth. That is why Ide teaches to use rollers that will roll along the inner diameter of the stator. Ide, when combined with the other references, thus does not suggest coil spring segments as contained in claims 4, 10 and 14.

Applicant respectfully requests reversal of the rejection of claims 1-14.

Respectfully submitted,

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